Linkin Log Project

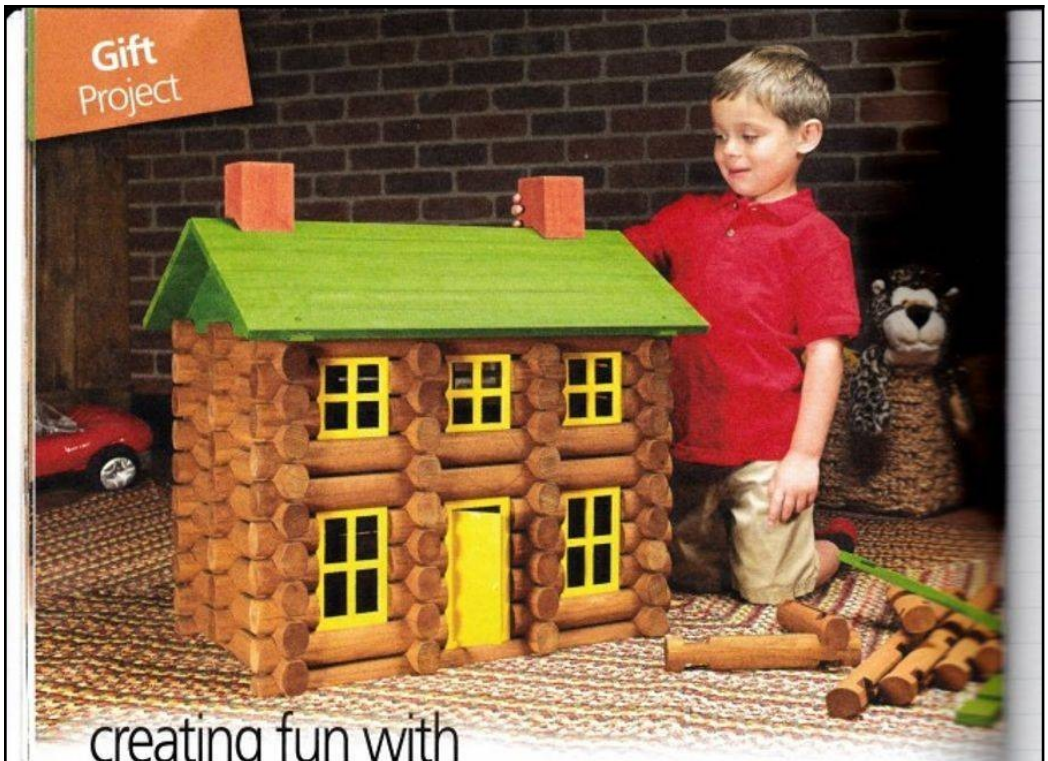
Back in April of 2016, I saw an article in a woodworking magazine on how to make a log cabin using “giant” size logs and decided to build one for my grandchildren to play with.

It turned out to be a big project that took many man-hours to complete. I then documented my build process on my woodworking web site. Unfortunately, the web site went out of business. I re-created the process and it is shown below.

This version was created in January of 2024. Several of my 8 grandkids have had a ball playing with this giant set.

Magazine Pattern

Woodsmith magazine has a pattern for building a "man-size" set of Linkin Logs, similar to the smaller Lincoln Logs. They can't call the project Lincoln Logs, because K-nex apparently owns the copyright on that name.



creating fun with

Linkin' Logs

We've taken a traditional children's toy and upsized it to create a fun building set that's sure to spark creativity in young and old alike.

One of my favorite memories as a child is building log cabins with *Lincoln Logs*. This classic toy is great for developing hand and eye coordination not to mention inspiring fun for kids of all ages.

Our Linkin' Logs are the perfect gift for any woodworker to make in Santa's workshop. The process of making the logs and accessories is pretty easy using tools you already have.

UPSIZE IT. The set of logs you see here is made from inexpensive poplar. They're larger than usual, which makes them easier for small hands to pick up and put in place. Plus, they offer the ability to add doors and windows. These are made from plywood and fit into grooves in the top and bottom edges of the logs.

ASSEMBLY LINE MANUFACTURING. As you might expect, there are a lot of pieces to make. It's a bit of a departure from building furniture — you're really just making a bunch of parts. And the more parts you have, the more creative you can get. I've given you a good starting point with the materials list on page 25. But you can make as many parts as you wish to create more building options.

The real trick is making so many identical parts quickly and consistently. The logs start with long blanks. Then you use simple jigs to cut the angled notches. Before cutting each of the logs to length with a handy cutoff jig, I'll show you how to create the rounded profiles.

Once you get started, you won't be able to stop. But that's okay. I bet you'll be building log cabins on your benchtop long before you apply the finish.

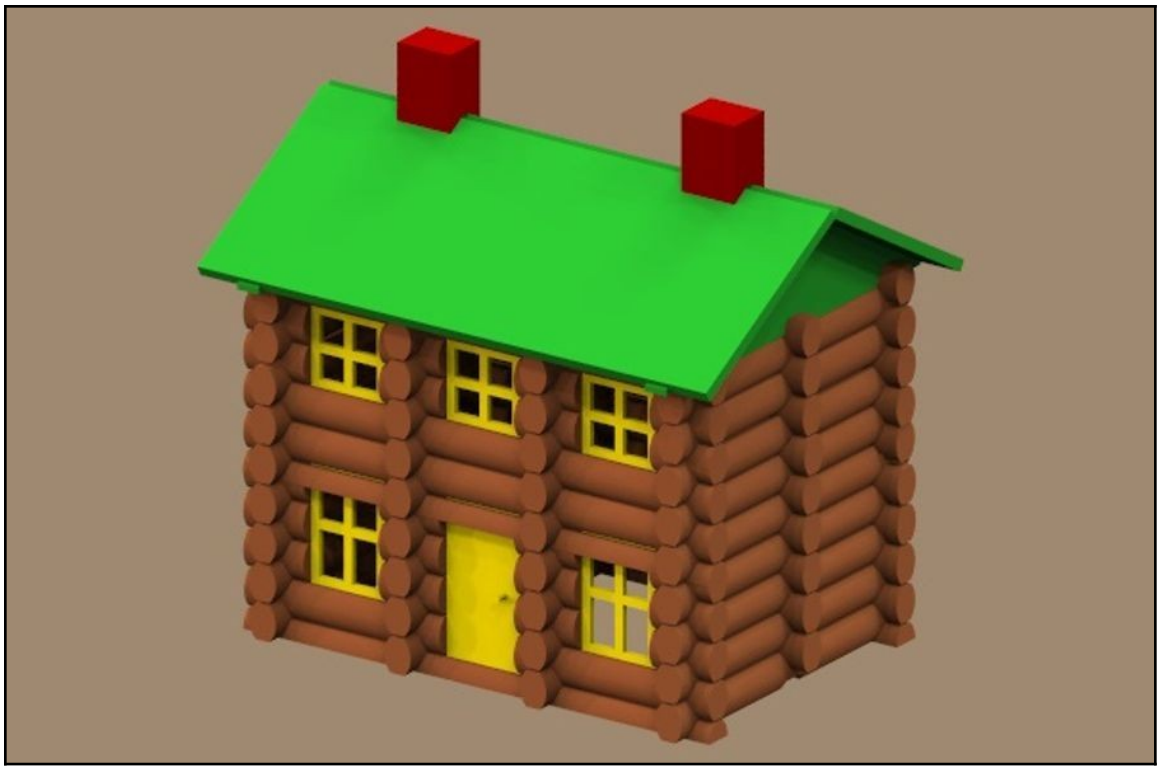
The original Lincoln Logs are only 3/4" in diameter. This huge set has logs that are 1.25x1.50 inches in size.

You can order the Linkin Logs plans here.

The Internet address is: http://www.woodsmithplans.com/plan/linkin-logs/

Google Sketchup

I entered the design into Sketchup and used I-render to make rendered drawings from the Sketchup file.



This next rendering has an adult female, so you get an idea of the final size of the large 2-story cabin.....

Wood Selection

The plans suggest poplar that is dyed to the brown, yellow, green, and red colors. I am using poplar for my project.

The logs are 1.25 x 1.50 inches, which means I have to glue up Menards standard thickness 3/4" pieces to net the 1.50 inches wide.

Each poplar board is about $14 each.

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order confirmation

Thank you for shopping with Blick!

Order Number: 15626640
Order Date: 4/12/2016
Payment Method: [redacted]

Billing Address:
Artephius Publishing
17 Brookwood Court
Fairbury IL 61739

Shipping Address:
Dale Maley
17 Brookwood Court
Fairbury IL 61739

Subtotal: $25.92
Shipping: $4.95
Sales Tax: $2.71
TOTAL: $33.58

Item	Item Detail	Price	Qty	Subtotal
00315-7099	DR MARTIN HYDRUS WC - SAP GRN 1OZ ✓ In stock and reserved	$6.48	1	$6.48
00315-3091	DR MARTIN HYDRUS WC - HYDRUS 1OZ WC RED OXIDE ✓ In stock and reserved	$6.48	1	$6.48
00315-4131	DR MARTIN HYDRUS WC - HYDRUS 1OZ. WC HANSA YLLW MED ✓ In stock and reserved	$6.48	1	$6.48
00315-8059	DR MARTIN HYDRUS WC - BURNT UMBER 1OZ ✓ In stock and reserved	$6.48	1	$6.48

Table Saw Fences

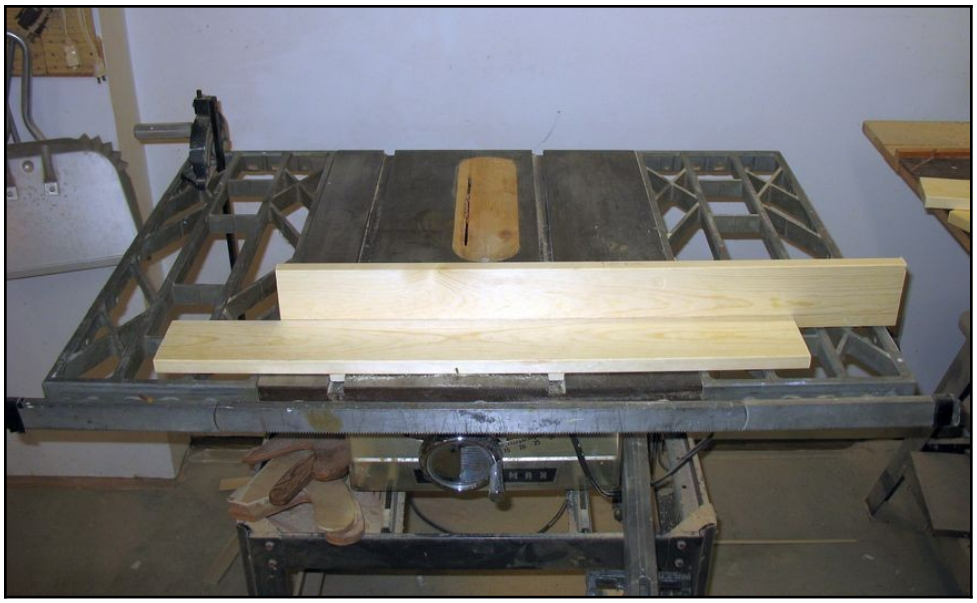
This project uses a table saw technique similar to cutting box joints. In that method, you use a wood key to index the pieces for each cut.....as shown on my Youtube video.....

https://www.youtube.com/watch?v=PGzF09n38-o

I decided to make a different fence for each step in the project, including the 3/4" bars that ride in the grooves on the table saw. This avoids having to remember which steel fence I used (I have 3 of them).

I made the fences from pine 1x4's.....here is the 1st one for cutting the 15 degree notch.....

For the key, I used a piece from a standard wood shim pack. I used 2 screws to hold the fence to the base piece. This fence has a starting position and a 2nd position with the key.



Dye

I ordered the dye recommended in the magazine article from DickBlick.com. I have never used this type of dye, so this should be interesting!

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Thank you for shopping with Blick!

Order Number: 15626640
Order Date: 4/12/2016
Payment Method:
[redacted]

Billing Address:
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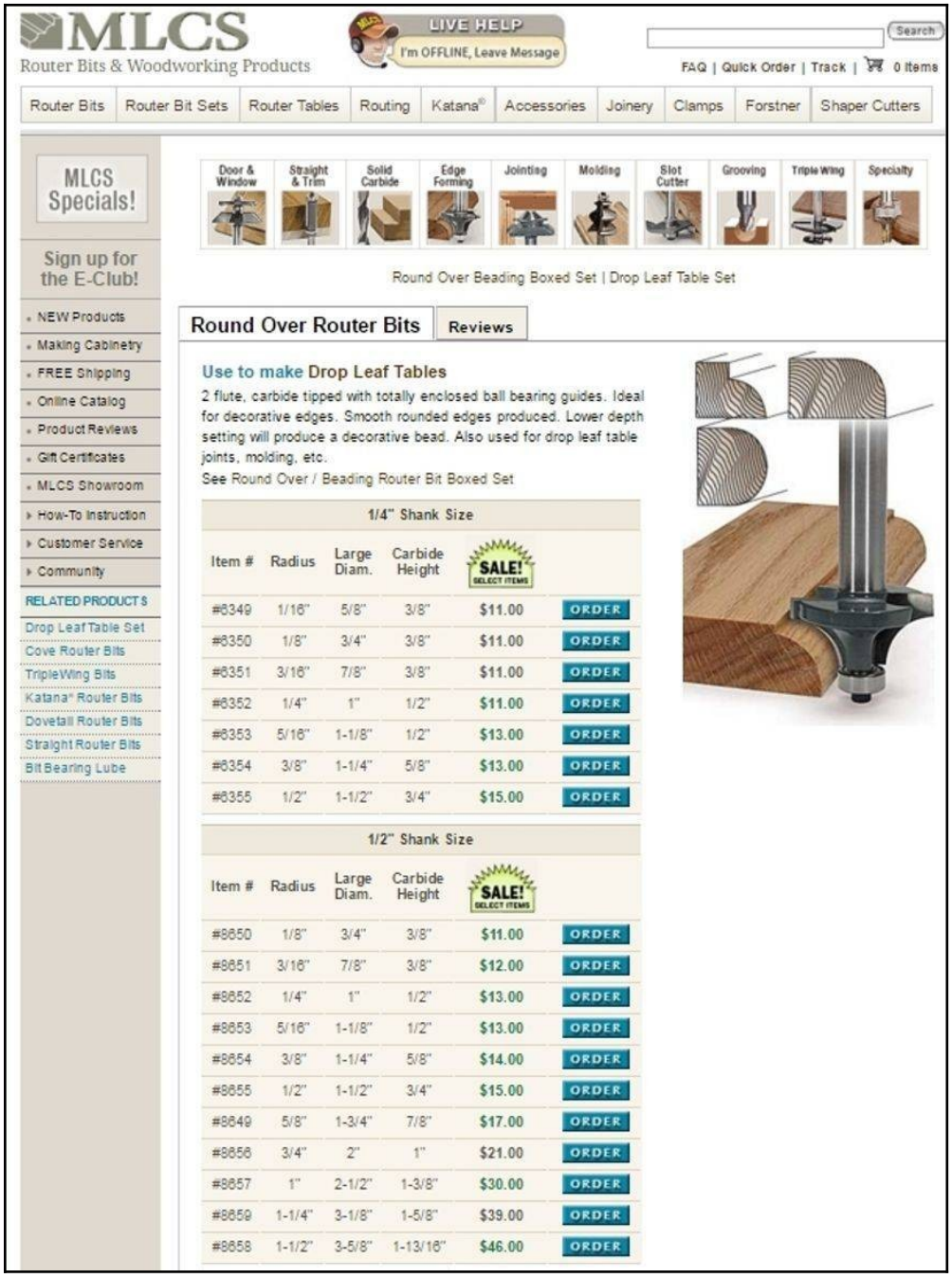
00315-8059	DR MARTIN HYDRUS WC - BURNT UMBER 1OZ ✓ In stock and reserved	$6.48	1	$6.48

Special 1" Round-Over Router Bit

I bought a special router bit for the radius on the side of the logs from MLCS.....…



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Round Over Beading Boxed Set | Drop Leaf Table Set

Round Over Router Bits | Reviews

Use to make Drop Leaf Tables

2 flute, carbide tipped with totally enclosed ball bearing guides. Ideal for decorative edges. Smooth rounded edges produced. Lower depth setting will produce a decorative bead. Also used for drop leaf table joints, molding, etc.

See Round Over / Beading Router Bit Boxed Set

1/4" Shank Size

Item #	Radius	Large Diam.	Carbide Height	SALE! SELECT ITEMS	
#8349	1/16"	5/8"	3/8"	$11.00	ORDER
#8350	1/8"	3/4"	3/8"	$11.00	ORDER
#8351	3/16"	7/8"	3/8"	$11.00	ORDER
#8352	1/4"	1"	1/2"	$11.00	ORDER
#8353	5/16"	1-1/8"	1/2"	$13.00	ORDER
#8354	3/8"	1-1/4"	5/8"	$13.00	ORDER
#8355	1/2"	1-1/2"	3/4"	$15.00	ORDER

1/2" Shank Size

Item #	Radius	Large Diam.	Carbide Height	SALE! SELECT ITEMS	
#8650	1/8"	3/4"	3/8"	$11.00	ORDER
#8651	3/16"	7/8"	3/8"	$12.00	ORDER
#8652	1/4"	1"	1/2"	$13.00	ORDER
#8653	5/16"	1-1/8"	1/2"	$13.00	ORDER
#8654	3/8"	1-1/4"	5/8"	$14.00	ORDER
#8655	1/2"	1-1/2"	3/4"	$15.00	ORDER
#8649	5/8"	1-3/4"	7/8"	$17.00	ORDER
#8656	3/4"	2"	1"	$21.00	ORDER
#8657	1"	2-1/2"	1-3/8"	$30.00	ORDER
#8659	1-1/4"	3-1/8"	1-5/8"	$39.00	ORDER
#8658	1-1/2"	3-5/8"	1-13/16"	$46.00	ORDER

MLCS

Thank You!
Your Order 578182 has been received.

Internet Order Number: 578182

Please keep this e-mail receipt for your records.

We have received your order.

Track Your Order.

YOUR ITEMS and ORDER TOTAL

Quantity	Name	SKU	Each	Total
1	Round Over bit 1" radius - 1/2" shank	#8657	$30.00	$30.00

Sub Total	$30.00
Shipping: Ship for FREE by MLCS BEST WAY	$0.00
Tax Total: No Tax (0.00%)	$0.00
Total	$30.00

1st Fence for cutting 15 Degree Cuts

I used (2) short ripped 2x4's and 2 long poplar pieces on my trial run of the process. I made it through the 1st fence ok, which cuts notches 1 way.

I then went through the 2nd fence cuts ok. Then I set up the 3/4" dado blade and removed the waste stock between notches. Then I started thinking "Houston, we have a problem!"

When I stacked a few logs, it was really a sloppy fit on the x-joints as shown in the picture above. I checked the design, and then checked my actual results.....and my notches were way too wide. Turns out, I mis-read the measurement for the 2nd notched cut that determines the notch width.

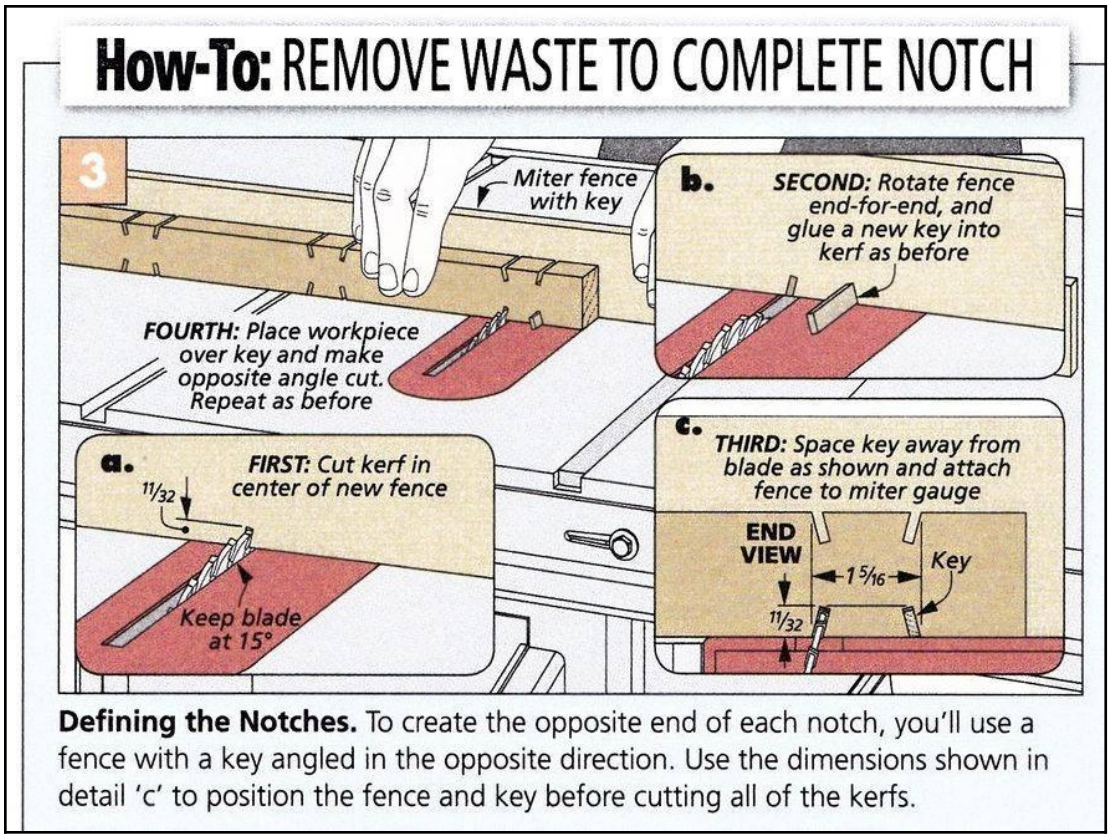
Oh well, I guess that is why you should always do a trial run to check out the process, before running miles of boards through the process!!

A big, 1" round-over bit is used to knock the corners off the logs. I made a new fence for my router table, and I clamped on a feather board as the plans suggested.

Plan Error

So I got the 2nd fence re-adjusted to the correct dimensions, and notched the 3 first boards. I set up the 3/4" wide dado set and started to dado cut. I then did a trial fit of 2 boards together at the notches. Again, "Houston, we have a problem!"

The top log was not setting clear down on the notch. I retrieved the magazine plans.....



Defining the Notches. To create the opposite end of each notch, you'll use a fence with a key angled in the opposite direction. Use the dimensions shown in detail 'c' to position the fence and key before cutting all of the kerfs.

In figure C above, it says to set the notch width at 1-5/16" at the top of the angled groove. With a 15 degree angle, it is going to be less than 1.25" at the bottom of the notch, which is the thickness of the mating log!!

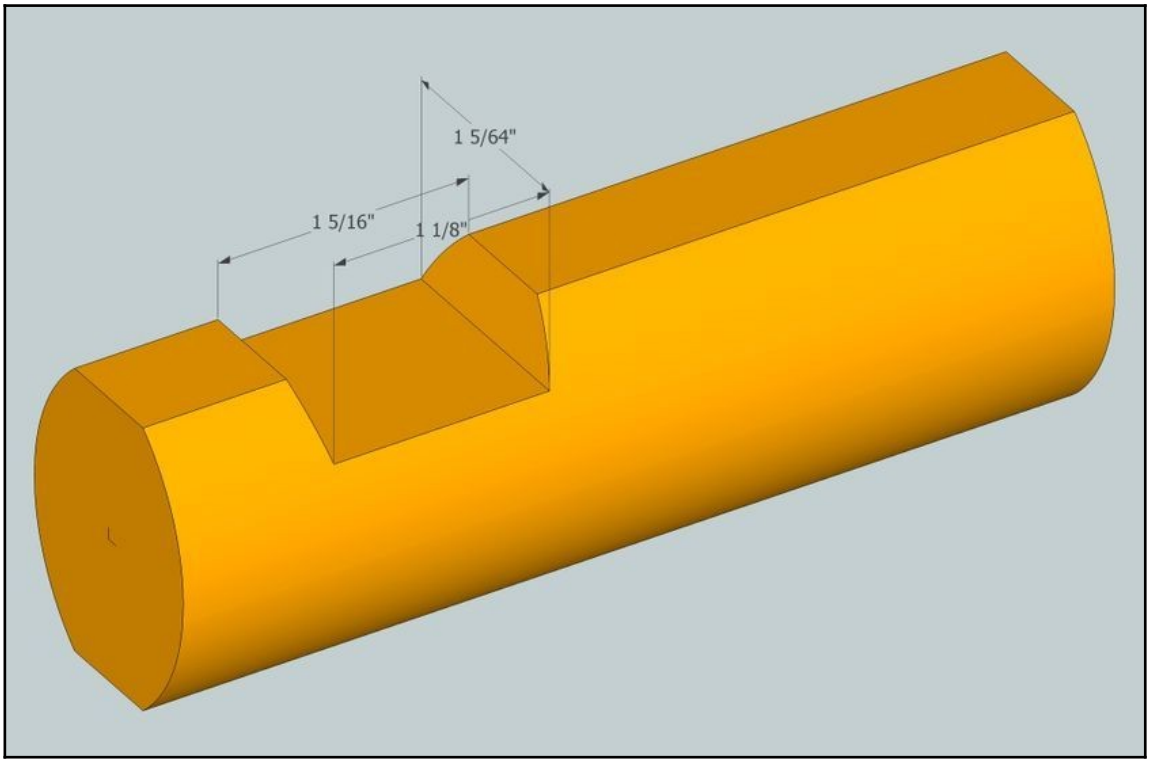
To have the logs set clear down in the notch, you want the bottom of the notch to be at least the same thickness as the mating log, or 1.25". You probably want to add a little to the notch width to allow for tolerance stack-up, so 1-5/16" would be about right.

I think what happened is that the illustrator in Figure C above, put the 1-5/16" dimension at the wrong point. He put it at the top of the notch, and it should have been on the bottom.

Fortunately, my existing work can be salvaged because the notch is not wide enough. I reset the 2nd fence to give the 1-5/16" width at the bottom of the notch, and re-sawed the boards.

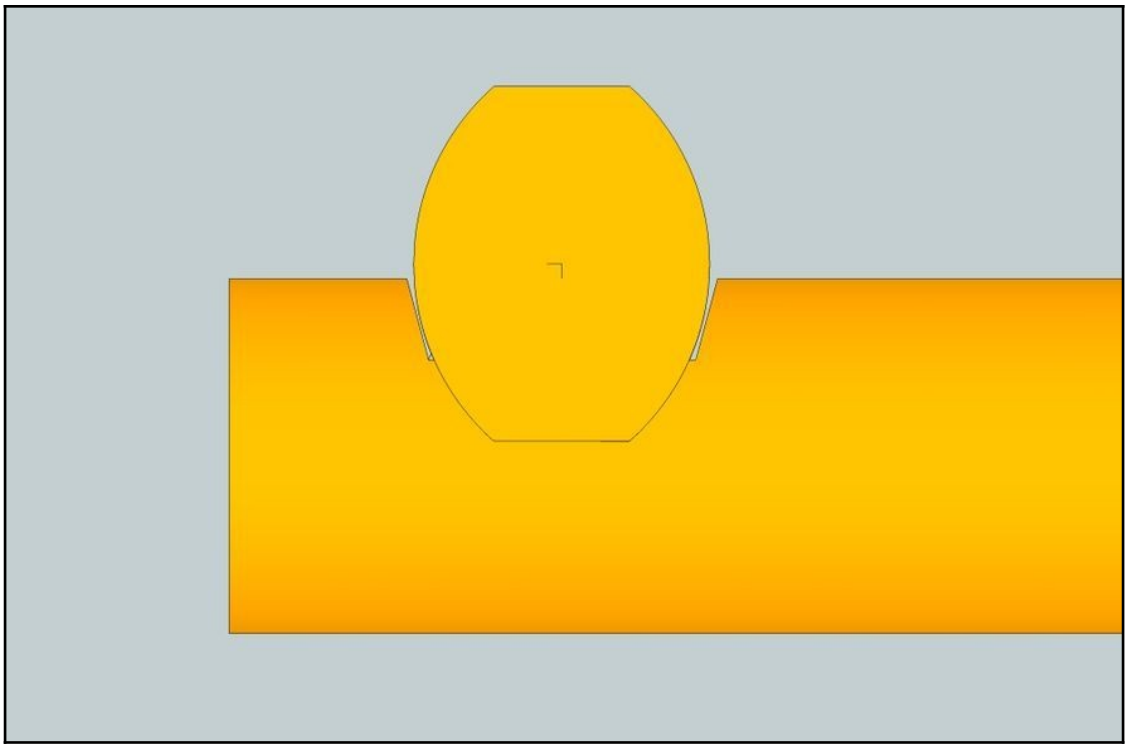
Further Analysis of Notch Width

I laid out the original plan design in Google Sketchup again. It turns out that the radius's on the side of the log reduce the width that sets in the mating notch, if you have the radius correct.....



If the tolerances are 0, then the 1-5/64 width at the bottom will fit into the 1-1/8" notch width at the bottom, with 3/64" clearance.....or 1.5/64 clearance on a side. Wow, this is too tight of tolerance given all the set-ups involved to generate this geometry.

This next Sketchup shows that with 0 tolerance, the 2 logs do fit together.....

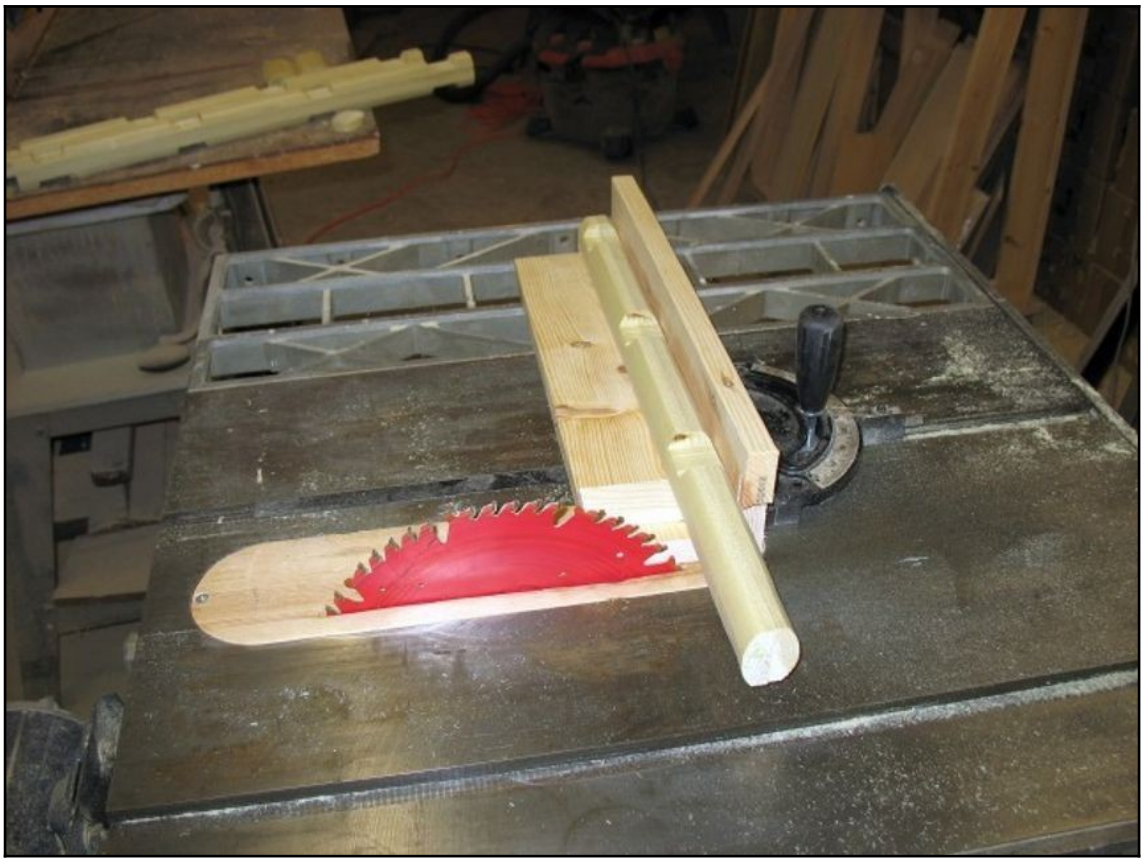


It turns out that my trial logs did not fit together because my radius is not deep enough from the router table. My fence board is a little warped, making my radius off a hair.

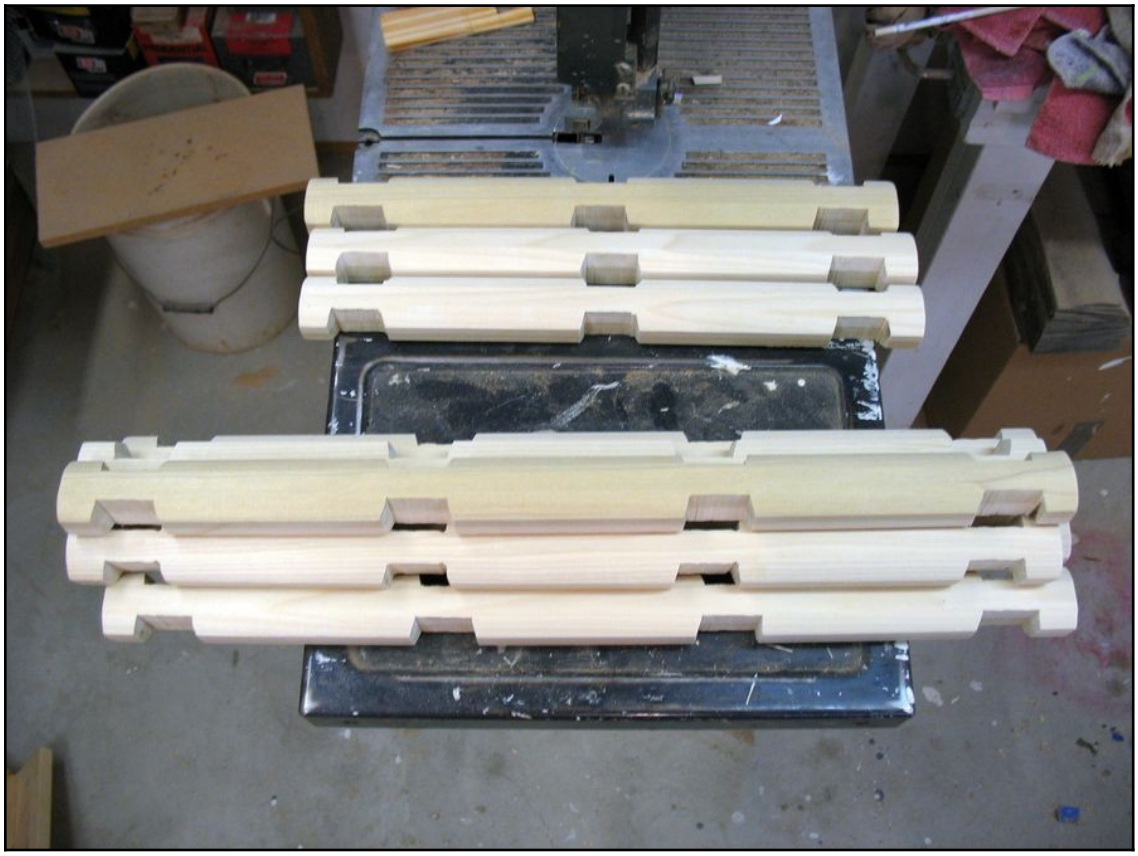
Since I'm well into making logs now, I am going to leave my set-ups alone, because the logs fit together fine. If I change the router table radius set-up, then some logs will fit sloppier after the change.

My set-up gives 1-5/16 notch width at the bottom, so if your 1" radius is a little off, the whole thickness of 1-1/4" still fits fine.

Length Cut-Off Fence on Table Saw

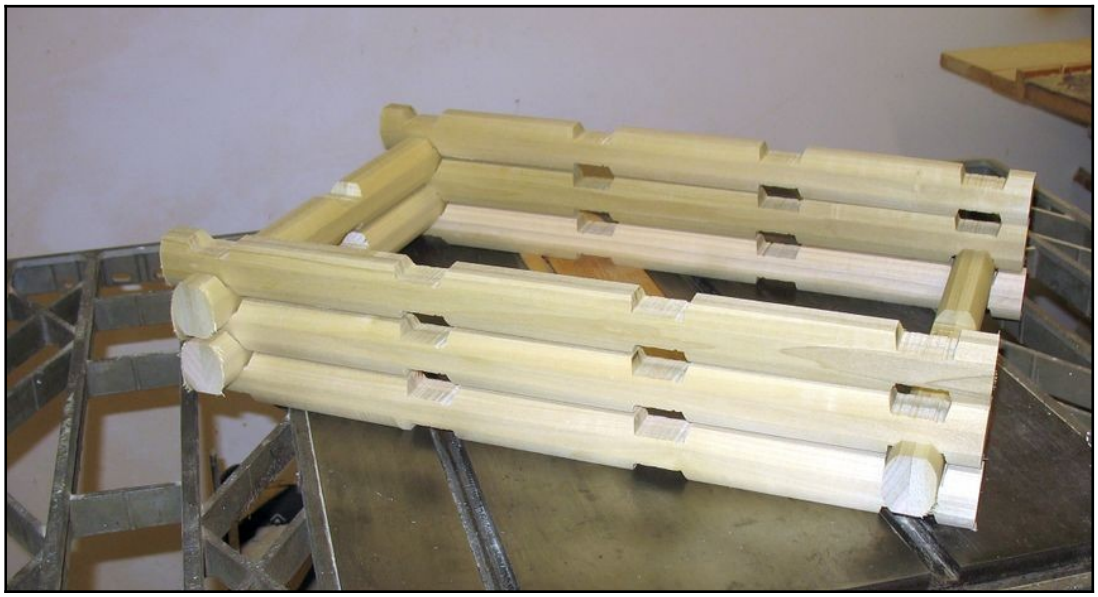


Yield from 2 Glued up 5.5 x 72" Poplar Boards



Each board is about $14 at Menards, so you get 9 logs for $28.

1st Completed Batch of Logs Before Dyeing



Dye

Each dye bottle costs $7.00 and is only 10 ounces, and comes with an eyedropper.....

The magazine article says the author diluted it by 25% with water. For the massive number of logs this project takes, it would take many bottles at $7.00 per bottle to dye all of those logs at that concentration.

I'm going to use maybe 10% dye and 90% water on the logs. Since there are only a few yellow and red parts, I will use them close to full strength. I will have to stretch the green dye also because there are 2 different roof sizes.

I think the lighter brown color will be fine for the logs.

I dyed the roof pieces a very dark green, but I ran out of dye (I only bought 1 bottle of green). I ordered 1 more bottle of green dye, and 2 more bottles of brown dye.

Thank you for shopping with Blick!

Order Number: 15662697
Order Date: 4/20/2016
Payment Method:
[redacted]

Shipped To:
Dale Maley
17 Brookwood Court
Fairbury IL 61739

Subtotal: $19.44
Shipping: $4.95
Sales Tax: $2.13
TOTAL: $26.52

Item(s) shipped April 20, 2016

Shipment 1 of 1
Shipped via FedEx SmartPost

Tracking Number: 612901001320717025 55

Item	Item Detail	Price	Qty	Subtotal	Shipment
00315-7099	DR MARTIN HYDRUS WC - SAP GRN 1OZ	$6.48	1	$6.48	1
00315-8059	DR MARTIN HYDRUS WC - BURNT UMBER 1OZ	$6.48	2	$12.96	1

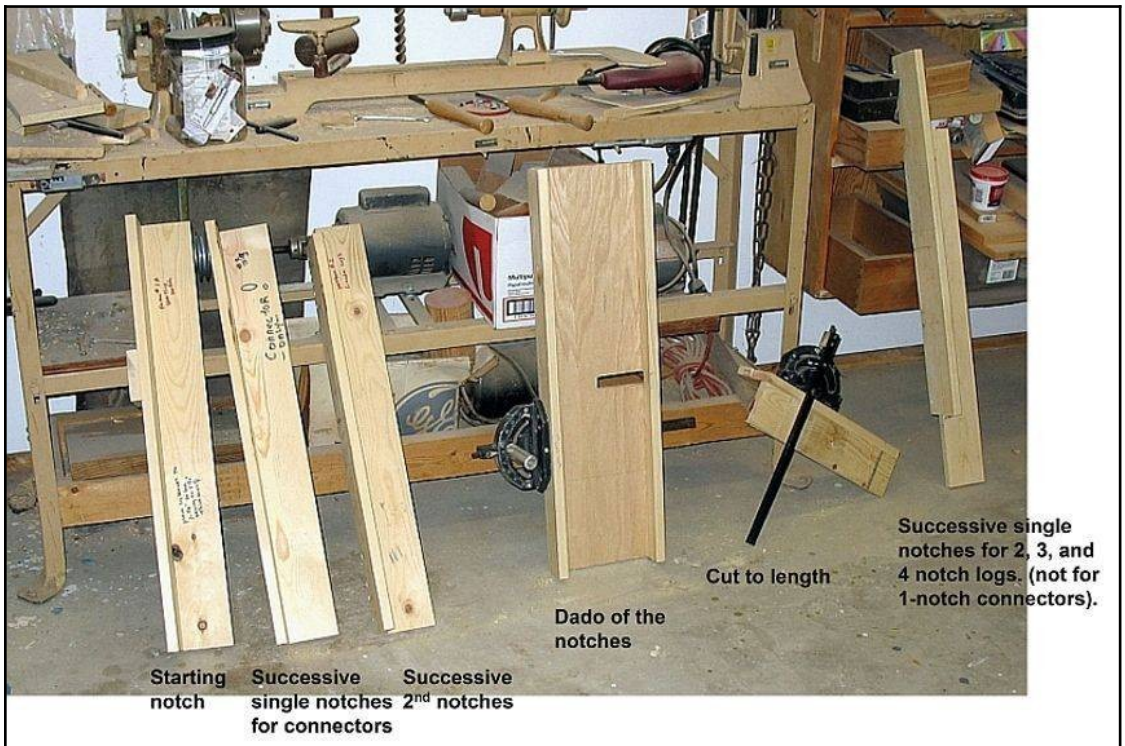
Dilution Instructions from Magazine Article

FINISHING. To finish all of the parts. I used a water-based dye diluted about 25% with water. Turn to Sources on page 67 to find out where to purchase the dye. Brush it on and allow it to dry thoroughly before setting out to build your log cabin structures. W

Many Table Saw fences Required for this Project

There are 5 different table saw fences required for this project.....

This does not include the router table fences. I made separate fences for the first angled cut, and then the successive angle cuts. That way I did not have to remove and re-install a new key on each batch of logs. The 4th to the right fence is the 3/4" dado blade fence, and the 5th to the right is the cut-off fence for log length.

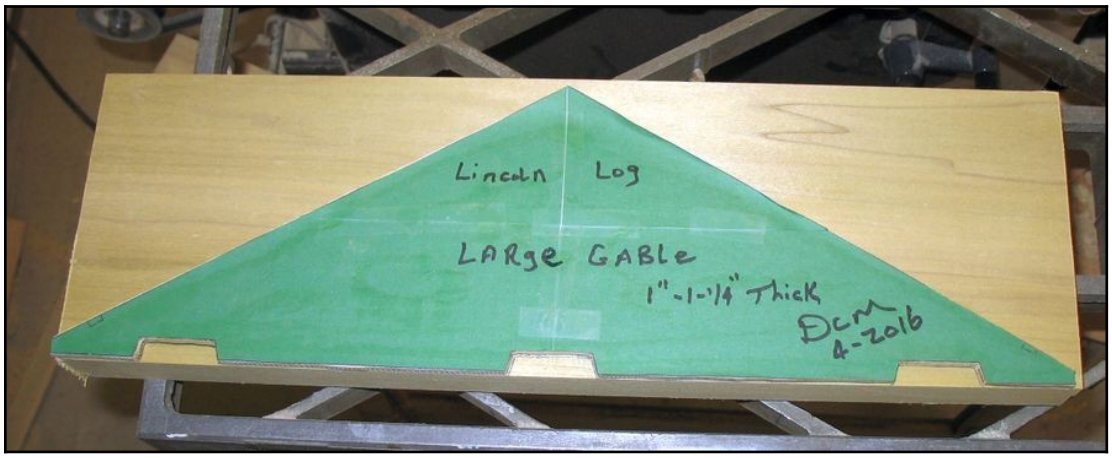


Requires a total of 6 fences for table saw + 1 fence for router table

Gables

The plans call for 1 inch thick small and large gables. I decided to make mine 1.25" thick since this thickness will fit fine on my logs.

I could have cut the 30 degree angles on my band saw, but I wanted to use the radial arm saw so I got a straighter roof line. Since the radial arm saw likes to kick sawing thick stock like 1.25", I added clamping to secure the board. The set-up worked fine and is a lot safer than not using any clamping.



CRAFTSMAN
8" RADIAL ARM SAW

Pumping out Logs

I spent 1-day pumping out more Lincoln logs. I started with the 4-notch ones first until I got the desired 24 total pieces.....then went down in size and worked on the 3-notch logs, etc.

The worst operation is the dado sawing of the notches. The dado blade throws dust and chips right back into your face. I have to shake out my shirt after each dado operation, just to get rid of the dust.

120 Connectors

I finished the 4, 3, and 2 notch logs, 48 each. I then made a new fence for the connectors, since the spacing is closer together to get more logs per unit length of board.

On the trial run of 1 piece, I noticed I got up to 1/4" offset between the top and bottom notch on a log. They still seem to work ok, sometimes you have to flip them end-for-end building with them. I am not sure why this happened. When I get some more poplar boards, I need to follow 1 board thru the process, and check this dimension as I go to see what the error was.

Total Project Cost

Most of the cost is in the Poplar wood. I wonder if common pine would also work. You would need to sort and not use the sections with knots would be the issue. My total cost estimate was $355.

Material Cost			
QTY	Description	Unit Cost	Extended Cost
18	5.5x72x0.75 Poplar	$14	$252
1	Yellow Dye	$9	$9
1	Red Dye	$9	$9
2	Green Dye	$9	$18
3	Brown Dye	$9	$27
1	Titebond Glue	$10	$10
1	Router bit	$30	$30
	Labor		$0
	Grand Total		$355

Routing the 1/4" groove in top and bottom of each Log

I used the set-up recommended in the magazine article with regards to using a feather board on the router table.

Once I got them all notched, I moved the feather board to the table saw, and ripped one log of each length size in half, to be used as the starting log. I did not take a photo of this set-up.

Fences

I made most of them 30 inches long as suggested, except the length fixture is shorter. I made most of them from 1x4 pine stock, except the dado fence has a piece of 3/4" thick plywood for the base. A lot of the man-hours required on this project in building the fences, and then adjusting them until they work correctly.

Building the Giant Log Cabin

Once I completed making all the logs, I started building the 2-story log cabin. As I needed pieces, I sanded and dyed them brown. The first problem I ran into was with the windows and front door. They were too large for my openings. I had to reduce their size on the table saw until they fit. The window and front door opening sizes is determined by the spacing dimension between notches, and the length from the end of the notch until the end of the log. Maybe my dimensions are just a hair different than the plan. I guess I should have waited to make the doors and window until after I had the logs done, to verify the correct dimensions.

Here is the 1-story large version completed.....

I had the dye mixture a little too light for some of the lower logs in the picture above. I dyed them again with a stronger brown color mixture so they were more alike.

At this stage, what I had left to do was.....

-Dye some of the logs a darker brown again that were too light
-lower the 1/4" gable dowels so roof slats did not interfere at top
-Dye some of the roof planks a darker green to better match the others
-Dye all the spare logs brown

I want to assemble the new 100 year anniversary set of Lincoln Logs, and photograph the 2 together for contrast.

Closing Thoughts on This Project Completed in April of 2016

There was a lot of work involved getting the 6 fences set up correctly for the table saw, plus additional router table fences. Of course, once they are set up correctly and verified, you can pump out a lot of logs.

Keeping alert making all the notches is definitely an issue. I had to force myself to keep "my mind on task" doing this repetitive and boring work.

The notch thickness threw me for a loop until I figure it out. I think my process with 1-5/16" thickness at the bottom of the notch is more forgiving from a woodworking process point of view.

My $72 Harbor Freight dado set I bought in early 2011 is not the highest quality, in terms of leaving a smooth bottom to the dados. Like most projects I have done with this dado set, it doesn't really matter if the bottom is perfectly smooth or not, in terms of function.

You should wait to make the front door and windows, until you start assembling the log cabin. The stack-up of tolerances could change the final dimensions of these items.

To get the correct 1/4" dowel location for the roof slats, I placed the slats in place (before they were notched) and start-drilled the dowel location. But after I notched the roof slats, the they interfered at the peak. I sawed off the dowels, then start-drilled at the new location with the notched slats, and then they met at the peak fine.

2019 Post Project Update

My grandchildren have been playing a lot with the small 100th anniversary set of Lincoln Logs. My oldest grandson is 4.5 years old right now. He did get to stand in the monster set I made.....

AND
LOVIN'

January 2024 Update

I have 8 grandchildren now. As they get old enough, they love taking the 2-story log cabin apart, then rebuilding it. The cabin is so ruggedly built, they can not really damage it when playing with it.